

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) Method of purifying a gas stream containing carbon dioxide and at least one impurity including hydrocarbons and nitrogen oxides, and ~~possibly optionally~~ water, ~~characterized in that it consists in:~~ comprising

A bringing the gas stream to be purified into contact with at least one adsorbent in aggregated form

- ~~either comprising at least 70%, preferably at least 80% and advantageously at least 85%, by weight of zeolite LSX, having at least 90%, preferably at least 95% and advantageously at least 98% of the exchangeable sites of which are occupied by sodium ions, and the rest of the cations possibly optionally being, for example, potassium cations, and up to 5% by weight of a binder that is inert to the adsorption, and possibly up to 25%, preferably up to 20% and advantageously up to 15% of one or more other zeolites, such as zeolite X, zeolite A, etc. or 5-25 parts by weight of a zeolitized clay binder per 100 parts of final aggregate (type A aggregate);~~
- or comprising at least 70%, ~~preferably at least 80% and advantageously at least 85%~~, by weight of a blend of at least 20% ~~and preferably at least 30%~~ of zeolite X and of at most 80%, ~~preferably at least 70%~~, by weight of zeolite LSX, said blend having at least 90%, preferably at least 95% and advantageously at least 98% of the exchangeable sites of the said zeolites X and LSX of which are occupied by sodium ions, the rest of the cations possibly optionally being, for example, potassium cations, and up to 5% by weight of a binder that is inert to the adsorption, and possibly or 5-25 parts by weight of a zeolitized clay binder per 100 parts of final aggregate and optionally up to 25%, preferably up to 20% and advantageously up to 15% of one or more other zeolites, such as zeolite A, etc. (type B aggregate);

B- adsorbing at least some of the carbon dioxide, and at least some of the hydrocarbons and/or N<sub>x</sub>O<sub>y</sub> on the said adsorbent and no other adsorbent;

- C- desorbing the impurities adsorbed on the said adsorbent; and
- D- regenerating the adsorbent.

2. (Currently Amended) ~~Method~~ A method according to ~~Claim 1~~ Claim 11 characterized in that a PSA, TSA, TPSA or TEPSA-type process is carried out.

3. (Currently Amended) ~~Method~~ A method according to ~~Claim 1~~ Claim 11, characterized in that the adsorbent is in the form of a type A aggregate and is prepared using a preparation process comprising the following steps:

① aggregation of the precursor product, i.e. the LSX-type zeolite initially in the powder state, with a binder that can convert to a zeolite;

② drying at a low temperature (~~around 80-100°C~~) around 80-100°C and calcination at a temperature between 300 and 700°C, ~~preferably between 400 and 600°C~~, of the product obtained at ①;

③ zeolitization of the binder and simultaneous or consecutive, partial or complete, insertion into the zeolitic structure of Na<sup>+</sup> ions instead of the already present exchangeable cations (~~especially K<sup>+</sup>~~) so as to have a final sodium exchange content of greater than or equal to 90%, ~~preferably greater than or equal to 95% and advantageously greater than or equal to 98%~~;

④ washing of the product obtained at ③; and

⑤ drying and activation at a temperature between 300 and 700°C, ~~preferably between 400 and 600°C, preferably in a stream of dry decarbonated air, advantageously in a continuously traversed bed~~, of the product obtained at ④.

4. (Currently Amended) Method according to ~~Claim 1~~ Claim 12, characterized in that the adsorbent ~~is~~ is type B in aggregated form and is prepared using a preparation process that comprises the following steps:

① aggregation of the precursor product, i.e. the blend of LSX-type and X-type zeolites initially in the powder state, with a binder that can convert to a zeolite;

② drying at low temperature (~~around 80-100°C~~) at around 80-100°C and calcination at a

temperature between 300 and 700°C, ~~preferably between 400 and 600°C~~, of the product obtained at ①;

③ zeolitization of the binder and simultaneous or consecutive, partial or complete, insertion into the zeolitic structure of Na<sup>+</sup> ions instead of the already present exchangeable cations (~~especially K<sup>+</sup>~~) so as to have a final sodium exchange content of greater than or equal to 90%, ~~preferably greater than or equal to 95% and advantageously greater than or equal to 98%~~;

④ washing of the product obtained at ③; and

⑤ drying and activation at a temperature between 300 and 700°C, ~~preferably between 400 and 600°C, preferably in a stream of dry decarbonated air, advantageously in a continuously traversed bed~~, of the product obtained at ④,

and ~~preferably~~ optionally prior to step ①, the X and/or LSX powders having undergone a sodium exchange, either before they are blended or just after they are blended.

5. (Currently Amended) ~~Method A~~ A method according to Claim 1, characterized in that the adsorbent in type A or B aggregated form is prepared using a preparation process comprising the direct aggregation of 95 parts by weight of zeolite LSX or an X/LSX zeolite blend with at most 5 parts by weight of binder, followed by sodium exchange and activation.

6. (Currently Amended) ~~Method A~~ A method according to Claim 1, characterized in that the adsorbent in type A or B aggregated form is prepared by aggregating a binder that can convert to a zeolite, followed by zeolitization of the binder essentially into LSX zeolite and/or LSX and X zeolites and activation of the adsorbent.

7. (Currently Amended) ~~Method A~~ A method according to Claim 1, characterized in that the gas stream to be purified is ~~based on~~ comprises air.

8. (Currently Amended) ~~Method A~~ A method according to Claim 1, characterized in that the gas stream to be purified is ~~based on~~ comprises syngas.

9. (Currently Amended) ~~Method~~ A method according to Claim 1, ~~characterized in that the adsorbent bed is a multilayer system made up of several different superposed adsorbent beds and/or~~ comprises at least one bed comprising a blend of several adsorbents including adsorbent type B.

10. (New) A method according to Claim 1, wherein the adsorbent comprises a binder which is a zeolitized clay in a concentration of 5-25 parts by weight.

11. (New) A method according to Claim 10, wherein the adsorbent comprises a type A aggregate.

12. (New) A method according to Claim 10, wherein the adsorbent comprises a type B aggregate.

13. (New) A method according to Claim 11, wherein at least 98% of the exchangeable sites in the zeolite LSX are occupied by sodium ions.

14. (New) A method according to Claim 12, wherein at least 98% of the exchangeable sites in zeolites X and LSX are occupied by sodium ions.

15. (New) A method according to Claim 14, wherein the blend comprises at least 30% and at most 80% zeolite X.

16. (New) A method according to Claim 1, wherein the number average of the LSX crystal size is less than 4 microns.

17. (New) A method according to Claim 1, wherein the binder is inert to adsorption.